Date	June 20 (night).	June 25 (night).	June 27 (a. m.).	June 27 (p. m.).	July 4 (p. m.).	July 14 (night).	July 18 (a. m.).	July 28 (night).	Aug. 1 (day).	Total.
Wind direction	E.	E.	E.	E.	SE.	SE.	SE.	E.	NE.	Total.
Total precipitation (in.)	0.25	0.42	0.90	0.30	0.22	0.49	0.77	0.10	1.53	....
Alkalis	210.	16.0	184.0	18.0	4.60	154.23	18.00	None.	116.0	720.83
Chlorine	14.2	17.5	16.3	14.25	14.26	7.10	13.40	17.75	14.2	128.96
Nitrites	.006	.004	.004	.004	.01	.011	Trace.	Trace.	Trace.	.039
Nitrates	.055	.05	.04	.06	.04	.03	.06	.01	.001	.346
Albuminoid ammonias	.02	27.0	28.00	8.00	18.60	10.80	14.00	....	4.80	92.62
Free ammonias	.40	11.0	12.00	3.00	14.20	8.40	1.36	....	1.10	52.26
Carbon dioxide	200.	16.0	26.4	53.60	42.40	29.40	69.60	19.50	26.25	483.15
Sulphates	118.8	75.20	52.60	60.04	5.30	72.70	283.40	23.00	25.00	616.04

NOTES, ABSTRACTS, AND REVIEWS.

Miss Frederica Boerner.

We regret to announce the death of Miss Frederica Boerner, at Vevay, Ind., on October 27, 1921.

Miss Boerner was the daughter of Charles G. and Josephine Boerner. She came with her parents from Ohio to Vevay when she was a mere child and spent practically her lifetime in that place.

On the death of her father in 1900, she succeeded him as cooperative weather observer, and has maintained the record with a few unimportant lapses due to illness for upward of 20 years. To the efforts of father and daughter, there is preserved to southeastern Indiana a practically unbroken record of the weather since 1865. Aside from her interest in keeping watch of the weather, Miss Boerner found time to take an active interest in the social and religious affairs of her home city. She passed away respected and loved by all who knew her.

ANNUAL MARCH OF TEMPERATURE IN SAMOA.

By G. ANGENHEISTER.

[Abstracted from *Meteorologische Zeitschrift*, Feb., 1921, pp. 47–50.]

A discussion of 30 years of observations reveals the fact that the annual march of monthly means of temperature is similar to the annual march of radiation, which may be computed by the formula

$$J = J_0 (d''/960'')^2 \int \sin h \, dt,$$

where h is the altitude of the sun, t the hour angle of the sun, and d the apparent radius of the sun in seconds of arc. The integral has to be computed between sunrise and sunset. If the atmospheric extinction is taken into account, the above formula becomes

$$J = J \; (d''/960'')^2 \int q^{\frac{1}{\sin h}} \sin h \, dt,$$

where q is the extinction coefficient. As extinction does not appreciably change the character of the curves, we can disregard it.

The temperature follows radiation,[1] their apparent difference in phase being equal to from one-half to one month. They both show a deep minimum in the middle of the year and a flat maximum at the beginning. Although the sun crosses the zenith of Samoa twice a year (Oct. 30, and Feb. 12), the daily amount of radiation shows only one maximum in January, because of the variation of the length of the day. When the radiation in Samoa diminishes about 1 per cent, the mean monthly temperature (with a retardation of one month as stated above) decreases about 0.0273°C. This coefficient varies at different places on the earth's surface. Knowing this coefficient and the mean temperature of one month for a certain station, it is possible to compute with great accuracy the annual march of temperature from the annual march of radiation.[2]

It is understood that such a simple relation is to be expected only in the uniform areas of tropical oceans. For Samoa, the difference between the computed temperature and the observed one is less than 0.1°C. The mean annual amplitude (observed) in Samoa is 1.1°C. The result of the investigation of the relation between the annual march of radiation and temperature is the following: Island stations damp the influence of short-period variations of radiation, while the long-period variations, although of small amplitude, are very well expressed. The contrary is observed at the land stations.

Maximum temperature occurs in Samoa shortly after noon. For two or three hours after that time, the temperature hardly changes, the average change being no more than 0.01°C.—*J. P.*

[1] The author is here evidently considering changes in radiation due to the changing declination of the sun,—not to changes in the intensity of solar radiation.—EDITOR.

[2] This study of the relation between the annual march of temperature in Samoa and the annual march of radiation is a specific example of a problem which was treated in a more general way for the whole earth by Angot, in *Annales du Bureau Central Météorologique de France*, for the year 1883, pp. B121–B169, in a paper entitled *Recherches théoretiques sur la distribution de la chaleur à la surface du globe*. The paper begins with a general bibliographic discussion, and proceeds to the development of formulae which give the heat received at the outside of the atmosphere in different seasons; next the question of atmospheric absorption is treated and the heat received at the surface with different degrees of atmospheric transparency discussed. The formula used by Angenheister above appears in essentially the same form in Angot's paper. A more detailed discussion follows in which the amount of heat received annually at each latitude from the equator to the poles, by ten-degree intervals, the heat received on the same day in different latitudes, and the total heat received during the year at different latitudes, are treated. The work is important and forms a substantial foundation for studies similar to that carried out by Angenheister.—*C. L. M.*

CITRUS CROP INSURANCE IN FLORIDA.

The following excerpts from the *Florida Grower* and the Tampa *Tribune* will be of interest in connection with the question of crop insurance as a possible substitute for the expensive smudging operations against frost:

Crop insurance is here at last. A Philadelphia firm * * * representing several big fire insurance companies is now prepared to write frost insurance on citrus crops. As I understand it [the representative] will write policies on individual groves or an association may take out a blanket policy on the crop of all its members. No provision is made for insuring trees, though that may come another year; it is being considered. Insurance applies only to fruit actually on the trees at time of damage and does not include injury to bloom, the policy automatically expiring on March 15. No policy goes into effect until 72 hours after it has been written. I presume this latter is to forestall applications that might be made at a time when a freeze may have been predicted by the Weather Bureau. Insurance will be confined to the south of the northern borders of Volusia, Marion, and Citrus Counties. Rates will be on a sliding scale, water protection having an influence in the rate making. The lowest rate will be 6 per cent and from that up to 8½ per cent, the insurance agent to be the judge as to the frost danger.

Great interest will no doubt be aroused among the growers at this announcement. Florida should feel honored that the plan is to be tried out here first. California will probably be considered another